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**TECHNICAL REVIEW COMMENTS ON THE
EXPOSURE ASSESSMENT TECHNICAL MEMORANDUM REPORT
OLIN CORPORATION, MCINTOSH PLANT
MCINTOSH, ALABAMA
JUNE 1992**

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This report presents technical review comments prepared by PRC Environmental Management, Inc. (PRC) on the Exposure Assessment Technical Memorandum prepared by Woodward-Clyde Consultants (WCC) for Olin Corporation. This report is dated June 1992. The risk assessment is part of the remedial investigation (RI)/feasibility study (FS) that is currently being conducted by Olin Corporation at their McIntosh, Alabama facility. The objective of the exposure assessment was to identify the human populations that are most likely to be exposed to site-related chemicals, the pathways by which these populations might be exposed, and the magnitude, frequency, and duration of these exposures. The exposure assessment determined that the exposure pathway likely to pose the highest risk to potentially exposed populations is consumption of fish caught in waters used for recreational purposes.

Based on the information reviewed, PRC has determined that the Exposure Assessment Technical Memorandum conformed with EPA guidance. However, technical deficiencies were found in specific sections of the report that WCC prepared. These deficiencies are presented in the following general and specific comments.

General Comments

1. The exposure assessment also should evaluate the potential health effects due to inhalation of volatile contaminants from ground water and surface water.
2. The report states that the risk to the current and future industrial workers at the facility was not evaluated because a well-managed health and safety plan will be implemented. It is not appropriate to make this assumption because protective health and safety plans may not be in place, administered, or adhered to.
3. A major data gap appears to be the lack of data from surface soil sampling. Therefore, depending on Phase III surface soil sampling results, the exposure assessment could be incomplete because it does not evaluate any potential exposures to surface soil or windblown dusts.

Specific Comments

1. Section 2.2, Page 10, last bullet. The text states that "most of the fish consumed by local residents comes from areas besides the basin." While this may be true, the exposure assessment should consider the possibility that contamination from the basin may reach the Tombigbee River.
2. Section 3.0, Page 12, OU-1 Offsite Groundwater Sampling. The offsite groundwater samples were analyzed for total mercury but not dissolved mercury. These samples should have been analyzed for dissolved mercury as well.

In addition, the last two sentences appear to contradict each other. The first sentence lists all of the analyses performed on the samples but the last sentence states that "the TCL volatile organics were selected as the organic analytes. . ." The text should clearly state which analyses were performed.

3. Section 4.3, Page 17, Paragraph 1. The last two sentences read as follows:
"However, a well managed health and safety plan implemented for current and future industrial workers would eliminate the potential for dermal exposure to groundwater from monitoring wells at OU-1. Therefore current and future industrial workers were not quantitatively addressed in this exposure assessment." This is not correct to assume an action (that is, implementation of a Health and Safety Plan) in the baseline risk assessment. In addition, the exposure assessment also does not address the potential for current worker exposure to contaminated water from production wells.
4. Section 4.3.2, Page 18, Paragraph 1. Insufficient rationale is provided to exclude the plant workers from the exposure assessment evaluation by assuming adherence to a properly administered health and safety plan (see comment 3).
5. Section 4.3.3, Page 18, Paragraph 1. The Hypothetical Receptor Populations section should address potential exposure to contaminated process water or water from production wells.
6. Section 4.4, Page 19, Paragraph 2. Domestic well water also would be used for bathing and showering in homes, and inhalation of and dermal contact with volatile organic compounds during showering could be a significant pathway. It should be addressed in the exposure assessment.
7. Section 4.5, Page 20, Paragraph 1. The fifth sentence states that "inhalation of volatile organic compounds at the site was not considered to be a significant exposure pathway," and goes on to state that the reasons for this are low concentrations of volatile organic compounds and dilution factors. The report should be more specific about what these dilution factors are and how low the concentrations are.
8. Section 4.7, Page 21, Paragraph 2. A rationale should be provided for the first sentence: "Direct contact exposure to surface soils from OU-1 (dermal and ingestion) by current and future industrial workers and future remediation workers is considered a complete exposure pathway but is not considered significant." The report should explain specifically why this is not considered significant.
9. Section 4.7, Page 22, Paragraph 2. The fourth sentence states that "Inhalation of constituents from groundwater is believed to be negligible at this site." This sentence should be substantiated.
10. Section 4.7, Page 22, Paragraph 3. The third sentence which states "However, due to the likelihood that such exposures would be minimal" is highly speculative because there is very limited data to support this statement.
11. Section 6.1, Page 27, Paragraph 3. The second sentence correctly defines the term "reasonable maximum exposure (RME)." The third sentence incorrectly states that "the RME represents the 90th percentile exposure, that is, the exposure expected to occur in 1 of every 10 exposed individuals." This third sentence should be deleted, because EPA did not attempt to define "RME" statistically or quantitatively in any documents that the reviewers were able to locate.
12. Section 6.2, Page 28, Paragraph 6. The last sentence describes body surface area exposed by remediation workers as 8 percent of the total body surface area, or the head. Hands, and possibly arms, also should be included as likely to be exposed during part of the year.

13. Section 6.2, Page 29, Paragraph 2. This paragraph states that soil consumption rates are assumed to be low (10 mg/day) for remediation workers because of implementation of protective procedures. This should not be assumed. The ingestion rate should be 50 mg/day, as suggested in the industrial scenario (EPA 1991).
14. Section 6.2, Page 30, Paragraph 2. It is not clear where the factor 0.68 was obtained to calculate the fraction of fish consumed from the contaminated source. The text states that a fraction ingested (FI) of 20 percent was estimated by multiplying 33 percent (fishing time spent in the river) by 0.68. The report should explain how the factor of 0.68 was obtained.
15. Section 6.2, Page 29, Paragraph 5. This discussion of how fish consumption rates were calculated is not straightforward, especially with respect to the discussion regarding weights to responses. For example, the meaning of the following sentence is completely obscure: "This calculation was performed by assigning 365, 52, 12, 24, and 4 to daily, weekly, monthly, biweekly, and occasional responses, respectively, for fish consumption obtained from the demographic analysis." The report must clearly explain how these fish consumption rates were derived.
16. Section 6.2, Page 30, Paragraph 3. Organic contaminants in ground water should be evaluated using the interim dermal guidance (EPA 1992), not by assuming that each chemical has the same permeability constant as water.
17. Section 6.2, Page 31, Paragraph 2. The matrix effect factor of 0.5, which is used by WCC in all soil and fish exposure calculations, is inappropriate. Almost all reference doses and slope factors are developed for administered doses, or intakes, not absorbed doses. In many of the studies used to develop reference doses and slope factors the compounds are administered to animals in food. In these cases, the matrix effect is already factored into the reference dose or slope factor. A matrix effect factor may be appropriate to use when evaluating the bioavailability of contaminants from soil, but this should be determined on a chemical-specific basis.
18. Section 8.0, Page 33, Paragraph 2. The correct terminology for CLP is contract laboratory program, not "Contract Laboratory Procedures."

REFERENCES

EPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors, OSWER Directive 9285.6-03, March 25.

EPA, 1992. Dermal Exposure Assessment: Principles and Applications, Interim Report, EPA/600/8-91/011B, January.